B. F. CARD.
Car-Ventilator.

No. 213,322. Patented Mar. 18, 1879.

Fig. 1.

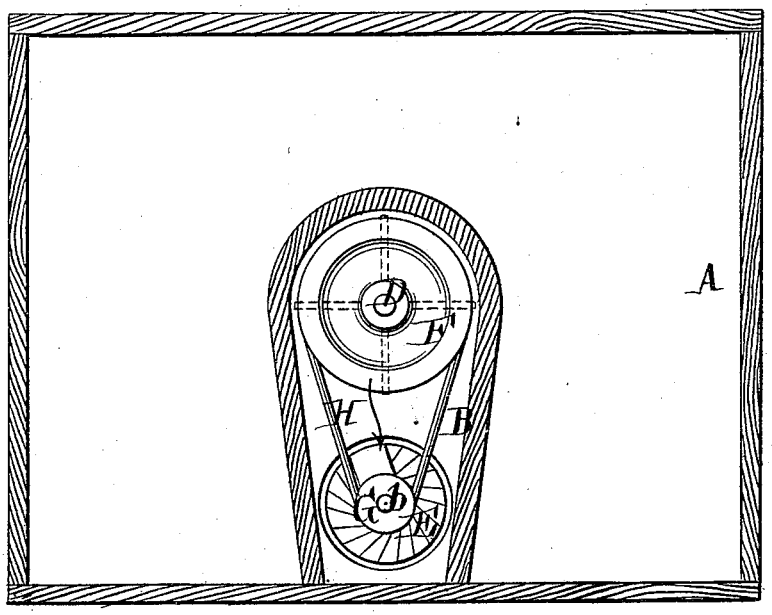

Fig. 2.

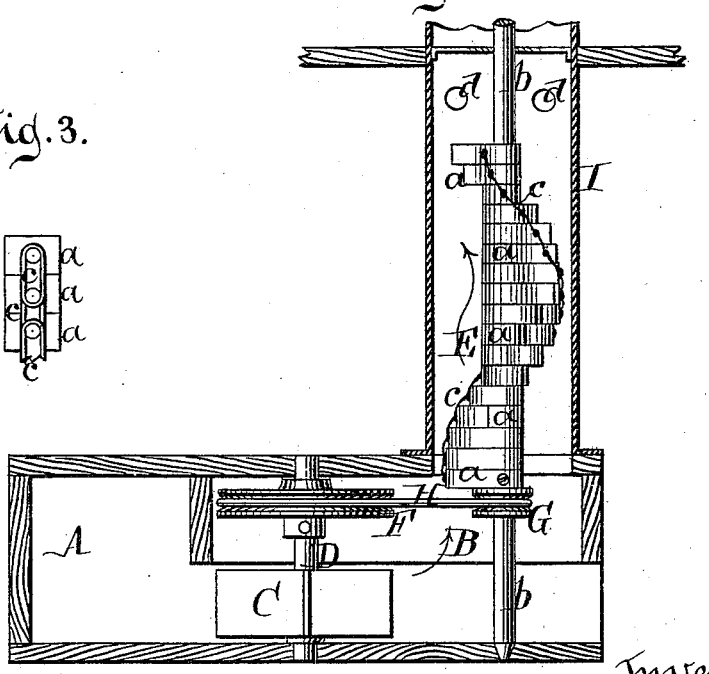

Fig. 3.

Witnesses
R. F. Thum Bonkerck
Louis W. Frost

Inventor.
Benjamin. F. Card

UNITED STATES PATENT OFFICE.

BENJAMIN F. CARD, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN CAR-VENTILATORS.

Specification forming part of Letters Patent No. **213,322**, dated March 18, 1879; application filed July 20, 1878.

To all whom it may concern:

Be it known that I, BENJAMIN F. CARD, of the city of Brooklyn, county of Kings, State of New York, have invented a new and useful Improvement in Ventilators for Cars, of which the following is a specification:

My invention relates to that class of cars for which Letters Patent of the United States were granted to me July 23, 1878, to which reference is made.

The invention consists in the combination, with a railroad-car, of an inclosed space beneath the bottom, with a spiral fan or suction-wheel attached to the bottom of this space, and running up through the floor of the car, and placed either at the ends or center, as desired, for the purpose of increasing and intensifying the current created by the fan-wheel described, claimed, and set forth in my Letters Patent of July 23, 1878, and for ventilating the car.

Above the floor of the car is attached a hollow tube or vertical flue for containing the fan. On the lower end of the spiral fan-shaft is a pulley, on which a belt is placed, that connects with a pulley on the shaft of the horizontal fan, which likewise is inclosed in the air-chamber. On the horizontal fan-shaft is another pulley, that connects, by means of a belt, with a pulley mounted on one of the axles of the car-wheel trucks. By this means motion is imparted to the horizontal and vertical fans.

The sides and ends of the bottom of the car are inclosed, forming an air-chamber, as shown in my Letters Patent above referred to.

The construction and operation are as follows:

In the accompanying drawings, in which similar letters of reference indicate like parts, Figure 1 represents a horizontal section of the car, looking in an upward direction. Fig. 2 is a central cross-section thereof. Fig. 3 shows a modification of the links for connecting the leaves of the vertical or spiral fan.

The sides and ends of the bottom of the car A are inclosed by a partition, forming an air-chamber. B is a horizontal air flue or chamber. C is a horizontal fan placed in the center of the air-chamber B. D is a fan-shaft, on which a pulley is connected, by a band, to a pulley mounted on one of the axles of the car-wheel. F is a pulley mounted on the shaft D, and connecting, by the belt H, to the pulley G, mounted on the shaft *b* of the spiral or vertical fan E.

The spiral or vertical fan E consists of two or more leaves, *a a*, made of wood, metal, or other suitable material. The leaves are made so as to slip over the shaft *b*, and beveled toward their outer end. The lower leaf is secured to the shaft *b*, and the other leaves *a a* move loosely on the shaft, and are connected together by links *c c*, made of cord or metallic strips.

Inside of and attached to the floor of the car is a vertical flue or cylinder, I, containing the spiral or vertical fan E. The flue I extends up through and out of the roof of the car. That portion of the flue I contained in the car has openings in it for ventilation.

The operation of my device is as follows: When the car is set in motion the revolution of the car-wheel causes the pulley mounted on one of the axles of the car-wheel to revolve, thus transmitting motion to the horizontal fan-wheel C, and from thence transmitting motion, by means of the pulley F and belt H on shaft of fan-wheel C, to pulley G on shaft *b*. This causes the spiral or vertical fan E to revolve, which produces a strong and intensified upward current of air, that is discharged at the top of the vertical flue I. (Shown by arrows in Fig. 2.) The current of air passing through the vertical flue I draws into that flue, through the openings *d d*, the foul air from the interior of the car, and discharges it at the top of and outside the car.

What I claim, and desire to secure by Letters Patent, is—

1. The combination, with a railroad-car, of an inclosed space, A, beneath the bottom of the car, having a horizontal fan-wheel, C, with its two pulleys, the belt H, the pulley G, mounted on shaft *b*, and spiral or vertical fan-wheel E, with two or more leaves, *a a*, connecting-links *c c*, vertical flue I, and openings *d d* in said flue, substantially as described, and for the purpose set forth.

2. The spiral or vertical fan-wheel E, consisting of the shaft *b*, leaves *a a*, connecting-links *c c*, constructed and arranged substantially as described.

3. In combination with a railroad-car, the vertical flue I, with its openings *d d*, and spiral or vertical fan-wheel E, substantially as described.

In testimony that I claim the foregoing I have hereunto set my hand this 19th day of July, A. D. 1878.

BENJAMIN F. CARD.

In presence of—
LOUIS W. FROST,
EDGAR J. PHILLIPS.